

4/25/18 "Too many of us are not living our dreams because we are living our fears."-Les Brown

HW: Finish the handout
Test 1 on Wednesday 5/2

Aim: More Area Between Curves

Warm Up:

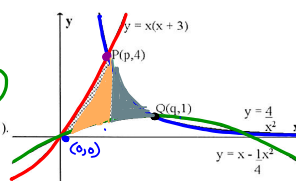
Get started on the worksheet

11. The diagram opposite shows an area enclosed by 3 curves:

$$y = x(x+3), \quad y = \frac{4}{x^2}, \quad \text{and} \quad y = x - \frac{1}{4}x^2$$

(a) P and Q have coordinates (p,4) and (q,1). Find the values of p and q.

(b) Calculate the shaded area.



a) $y = x(x+3)$
 $y = \frac{4}{x^2}$

we know $y=4$ b/c $P=(p,4)$

$$4 = x(x+3) \quad \text{OR} \quad 4 = \frac{4}{x^2}$$

$$4 = x^2 + 3x \quad 4x^2 = 4$$

$$0 = x^2 + 3x - 4 \quad x^2 = 1$$

$$(x+4)(x-1) \quad x = -1, x = 1$$

$$p = 1$$

Now q we know $y=1$ b/c $Q=(q,1)$

$$y = \frac{4}{x^2} \quad 1 = \frac{4}{x^2} \quad x^2 = 4$$

$$x = 2, x = -2$$

$$y = x - \frac{1}{4}x^2 \quad 1 = x - \frac{1}{4}x^2$$

$$\frac{1}{4}x^2 - x + 1 = 0 \quad q = 2$$

$$x^2 - 4x + 4 = 0$$

$$(x-2)(x-2)$$

$$x = 2$$

b) Area of Orange = $\int_0^1 (x(x+3) - (x - \frac{1}{4}x^2)) dx = \frac{17}{12}$

NORMAL FLOAT AUTO REAL RADIAN MP

$$\int_0^1 (x(x+3) - (x - \frac{1}{4}x^2)) dx$$

Ans>Frac 1.416666667

$\frac{17}{12}$

Area of Grey = $\int_1^2 (\frac{4}{x^2} - (x - \frac{1}{4}x^2)) dx = \frac{13}{12}$

NORMAL FLOAT AUTO REAL RADIAN MP

$$\int_1^2 (\frac{4}{x^2} - (x - \frac{1}{4}x^2)) dx$$

Ans>Frac 1.083333333

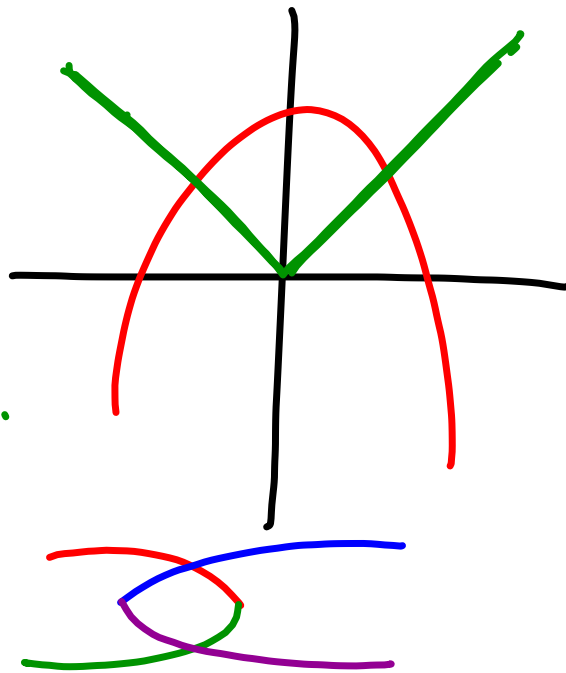
$\frac{13}{12}$

Total Area = Orange Area + Grey Area

$$\text{Total Area} = \frac{17}{12} + \frac{13}{12}$$

$$\text{Total Area} = \frac{30}{12} \text{ or } \frac{5}{2} \text{ units}^2$$

5)



$$10) \quad x = 4 - y^2$$

$$x - 4 = -y^2$$

$$-x + 4 = y^2$$

$$\pm \sqrt{-x + 4} = y$$

$$y = \sqrt{-x + 4}$$

$$y = -\sqrt{-x + 4}$$